## ABSTRACT OF THE INVENTION

Systems and methods for determining offset phasors are disclosed. An offset vector is computed from a current channel impulse response and a previous channel impulse response. A first vector and a second vector are simultaneously and iteratively rotated in opposite directions to determine an offset phasor. A first vector of the pair of vectors is initialized with a constant value for its x coordinate and a zero for its y coordinate. A second vector of the pair of vectors is initialized with the x and y coordinates of the offset vector. The vectors are rotated in opposite directions using shift operations for a specific number of iterations. After the final rotation, the y coordinate of the second vector has become zero and the x and y coordinates of the first vector correspond to the sine and cosine of the angle formed by the offset vector. The cosine and sine terms form the real and imaginary parts of the offset phasor.